

AQA P2: Differences Between Foundation and Higher

For P2 there aren't many big differences between the **Foundation** and **Higher** tiers in terms of *content*. If a section isn't listed in the table below, then you need it for **both tiers**. Check the full specification (or with your teacher) for more details.

Learn	Don't worry about
in Forces	
Drawing distance/time and velocity/time graphs	Calculating speed from a d/t graph, or acceleration or distance from a v/t graph
Objects have more KE when they move faster	The equation for kinetic energy $KE = \frac{1}{2} mv^2$
What momentum is that $momentum = mv$ forces cause changes in momentum	The equation involving how force affects momentum (this is the idea of impulse)
in Electricity	
Mains electricity has a frequency of 50Hz	How to convert the period of an electrical signal to the frequency
A mains plug has three connections , what the colours are and what they are used for	How the voltage on the live and neutral changes over time
$power = energy/time$ for electricity: $power = current \times voltage$	Equations involving charge: $energy = voltage \times charge$ $charge = current \times time$

The biggest difference between the tiers is the **style of questions** on the paper.

- Foundation will have more questions where you need to **use what you have revised** to make the correct choice from some possible answers.
- There will be **fewer equations** and you won't need to rearrange as much.
- You will still need to remember **key facts, units** and **symbols** to get marks.
- Written answers will be shorter and you will probably have less space, so write **simple, short sentences** – perhaps even bullet points – and avoid waffling.
- Data-analysis will be less complex, but that doesn't have to mean easy – look at tables and graphs carefully, checking **headings** and using **units** to give you clues.

For an example, have a look at the two questions over the page. One is from Foundation, the other from Higher. They test similar (although not identical) factual knowledge but in different ways. The full questions can be seen on the www.aqa.org.uk website.

AQA P2 Higher Tier (Q4 June 2009, summarised to save space)

- 4 The diagram shows a child on a playground swing.
The playground has a rubber safety surface.
- 4 (a) The child, with a mass of 35 kg, falls off the swing and hits the ground at a speed of 6 m/s.
- 4 (a) (i) Use the equation in the box to calculate the momentum of the child as it hits the ground.

$$\text{momentum} = \text{mass} \times \text{velocity}$$

Show clearly how you work out your answer and give the unit.

Momentum =
(3 marks)

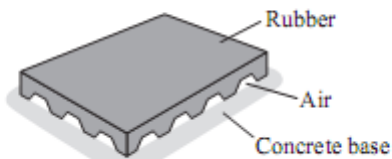
- 4 (a) (ii) After hitting the ground, the child slows down and stops in 0.25 s.
Use the equation in the box to calculate the force exerted by the ground on the child.

$$\text{force} = \frac{\text{change in momentum}}{\text{time taken for the change}}$$

Show clearly how you work out your answer.

Force = N
(2 marks)

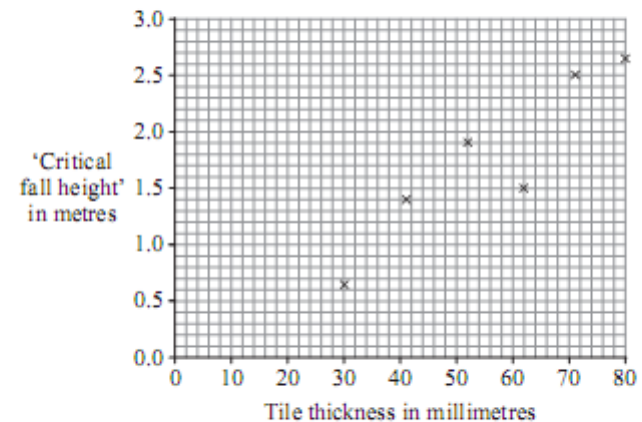
- 4 (b) The diagram shows the type of rubber tile used to cover the playground surface.



Explain how the rubber tiles reduce the risk of children being seriously injured when they fall off the playground equipment.
(3 marks)

- 4 (c) The 'critical fall height' is the height that a child can fall and **not** be expected to sustain a life-threatening head injury.
A new type of tile, made in a range of different thicknesses, was tested in a laboratory using test dummies and the 'critical fall height' measured. Only one test was completed on each tile.

The results are shown in the graph.



The 'critical fall height' for playground equipment varies from 0.5 m to 3.0 m.

Suggest **two** reasons why more tests are needed before this new type of tile can be used in a playground.

(2 marks)

- 4 (d) Developments in technology allow manufacturers to make rubber tiles from scrap car tyres.

Suggest why this process may benefit the environment.

(1 mark)

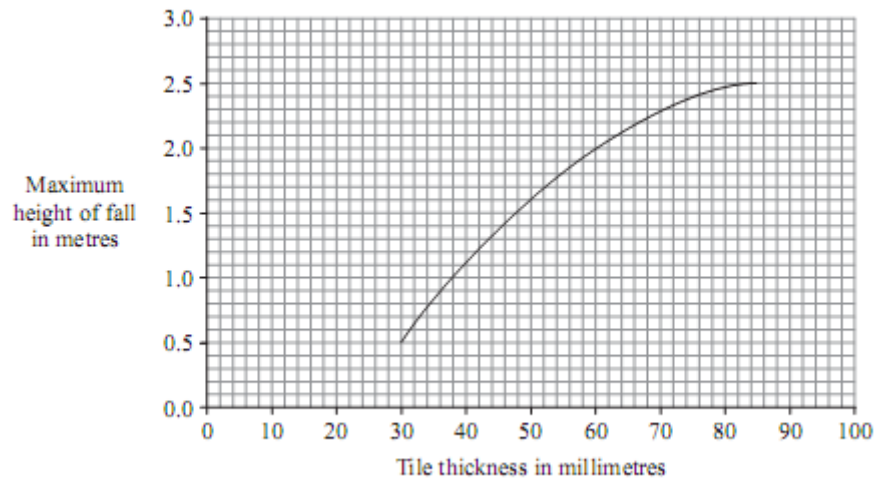
On Higher tier, you need to use two equations (five marks of the eleven available), answer open-ended questions, consider the quality of the data, and read from a graph. In 4(b) marks were only awarded to students who discussed the increased time taken for impact (i.e. explained impulse).

6 The diagram shows a child on a playground swing.



6 (a) The playground surface is covered in rubber safety tiles. The tiles reduce the risk of serious injury to children who fall off the swing.

The graph gives the maximum height that a child can fall onto rubber safety tiles of different thicknesses and be unlikely to get a serious head injury.



AQA P2 Foundation Tier (Q6 June 2009)

6 (a) (i) Describe how the maximum height of fall relates to the thickness of the rubber safety tile.

.....

 (1 mark)

6 (a) (ii) The maximum height of any of the playground rides is 2 metres.

What tile thickness should be used in the playground?

Give a reason for your answer.

.....

 (2 marks)

6 (b) Use phrases from the box to complete the following sentences.

the force on the work done to stop the time taken to stop

6 (b) (i) Falling onto a rubber surface compared to a hard surface increases

..... the child.
 (1 mark)

6 (b) (ii) Momentum is lost more slowly falling onto a rubber surface than on a hard surface.

This reduces the child.
 (1 mark)

On Foundation tier, you are given more structure (and it is a shorter question). Instead of writing longer answers in your own words you will need to choose from the options given. You will still need to understand the physical situation involved (here, a child falling on to rubber tiles).